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10/602,638	06/25/2003	Dong-seog Han	1349.1217	1052
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STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER JOSEPH, JAISON	
			ART UNIT 2611	PAPER NUMBER
			MAIL DATE 01/09/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/602,638

Applicant(s)

HAN ET AL.

Examiner

Jaison Joseph

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5,8,9 and 12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5,8,9 and 12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- ☐ Notice of Informal Patent Application
- ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments filed 10/24/2007 have been fully considered but they are not persuasive.

Regarding claim 1, 2, 4 and 5, Applicant argue, "Amended claim 1 Recites.... allowable for at least the forgoing reasons." However Examiner respectfully disagrees. Applicant admitted prior art does teach the limitation "said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal from said decision unit". As applicant admitted, AAPA teaches "conventional art (referring to Figure 2 of the present application) where the equalization error is calculated by using an output signal from the filter 42 (which is the input to the decision unit) and a signal of a predetermined level outputted from the decision unit 46 through the filter 42" (see page 5 of the remarks). Thus AAPA teach the limitations of "said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal from said decision unit". Further, Fimoff et al further teach that a decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values (see figure 4 and column 6, lines 39 – 47). Therefore AAPA in view of Omura and further in view of Fimoff teach all cited limitations. Thus Examiner maintains the rejection of claim 1. Further Applicant is reminded that Examiner is entitled to give broadest reasonable interpretation to the language of the claims.

Regarding claim 8,9,11 and 12, for the same reasons as stated above, the combination of AAPA in view of Omura and further in view of Fimoff teach all cited limitations. Therefore Examiner maintains the rejection of claims 8,9,11 and 12. Applicant is reminded that Examiner is entitled to give broadest reasonable interpretation to the language of the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4 – 6, 8, 9, and 11 – 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (AAPA) in view of Omura et al, (US Patent 6,559,894) and further in view of Fimoff et al (US Patent 7,035,353).

Regarding claim 1, AAPA disclosed in Figure 2, a linear equalizer for a single carrier receiver comprising a filter unit initializing coefficients of filters and filtering a preghost of the received signal and an error calculation unit calculating an equalization error using an output signal from said filter unit; a decision unit deciding a signal level for an output signal from said filter unit; said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal from said decision unit (see paragraph 6 – 9). AAPA does not disclose a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a

generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients. However in analogous art, Omura et al teach a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients (see figure 5, components 502, 512, 514 and column 7, lines 6 –59). , Omura et al further teach said channel estimation unit includes a correlation cumulation unit calculating an cumulating correlation values between the received signal and the field synchronizing signal (see figure 6, and column 7, lines 17 – 32). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of using channel estimation to initialize the equalizer in AAPA. The motivation or suggestion to do so is the equalizer will be more stable and can recover quickly after loss of synchronization (see column 3, lines 20 –28).

AAPA inview of Omura et al does not expressly teach estimation decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values. However, it is well known in the art that determining the channel estimate by applying a predetermined threshold value to the cumulated correlation values. Further, Fimoff et al further teach that a decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values (see figure 4 and column 6, lines 39 – 47). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Fimoff in AAPA in view of Omura to detect the received signal more accurately.

Regarding claim 2, which inherits the limitations of claim 1, AAPA further teach said filter unit updates the coefficients of the filters according to the equalization error and filters the pre-ghost and post-ghost using the updated coefficients of the filters (see paragraph 4).

Regarding claim 5, which inherits the limitations of claim 1, AAPA further teach error calculation unit calculates the equalization error using the output signal from said decision unit and the field-synchronizing signal (see paragraph 8).

Regarding claim 8, AAPA teach a decision feedback equalizer comprising a feed forward unit (figure 3, component 342) initializing coefficients of a first filter and filtering a pre-ghost of the received signal, a feedback unit (figure 3, element 43) initializing coefficients of a second filter and filtering a post-ghost of the received signal; and an error calculation unit (figure 3, component 47) calculating an equalization error using output signals from said FF and FB units, AAPA further teach an adder (see figure 3, adder 44) for adding the output signals from said FF and FB units to output a resulting signal (the output signal from the adder); a decision unit (see figure 3, component 46) deciding a signal level for an output signal from said adder and inputting the resulting signal of the predetermined level of said FB unit, wherein said error calculation unit calculates the equalization error using an input signal to said decision unit and an output signal of the predetermined level from said decision unit (see paragraph 10). AAPA does not disclose a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients. However in analogous art,

Omura et al teach a channel estimation unit estimating channel estimation values using a received signal inputted thereto and a generated field-synchronizing signal and using the channel estimation to initialize the filter coefficients (see figure 5, components 502, 512, 514 and column 7, lines 6 –59). Omura et al further teach said channel estimation unit includes a correlation cumulation unit calculating an cumulating correlation values between the received signal and the field synchronizing signal (see figure 6, and column 7, lines 17 – 32). Therefore it would be obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teachings of using channel estimation to initialize the equalizer in AAPA. The motivation or suggestion to do so is the equalizer will be more stable and can recover quickly after loss of synchronization (see column 3, lines 20 –28).

AAPA in view of Omura et al does not expressly teach estimation decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values. However, it is well known in the art that determining the channel estimate by applying a predetermined threshold value to the cumulated correlation values. Further, Fimoff et al further teach that a decision unit deciding the channel estimation values by applying a predetermined threshold value to the cumulated correlation values (see figure 4 and column 6, lines 39 – 47). Therefore it would have been obvious to an ordinary skilled in the art at the time the invention was made to incorporate the teaching of Fimoff in AAPA in view of Omura to detect the received signal more accurately.

Regarding claim 9, which inherits the limitations of claim 9, AAPA further teach said FF and FB units updates the coefficients of first and second filters, respectively according to the equalization error and filters the pre-ghost and post-ghost using the updated coefficients of the first and second filters (see paragraph 10).

Regarding claim 12, which inherits the limitations of claim 11, AAPA further teach error calculation unit calculates the equalization error using the output signal from said adder and the field-synchronizing signal 9see paragraph 12).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jaison Joseph whose telephone number is (571) 272-6041. The examiner can normally be reached on M-F 9:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on (571) 272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jaison Joseph
01/04/2007


CHIEH M. FAN
SUPERVISORY PATENT EXAMINER